Clean Air Act 112 (r) Risk Management Program (R M P) E P C R A

# CHEMICAL EMERGENCY PREVENTION & PLANNING Newsletter

October-November 2006 EPA Region 10

## Inside This Issue



CHEMICAL EMERGENCY PREVENTION & PLANNING
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# HAPPY BIRTHDAY, C A M E O !

## A Software Product Celebrates 20 Years of Supporting Emergency Responders and Planners Around the World

**CAMEO** (Computer Aided Management of Emergency Operations) is 20 years old this year. It began in 1986 as a collaborative development effort by National Oceanic and Atmospheric Administration (NOAA)'s Office of Response and Restoration (OR&R) and Seattle-area firefighters. OR&R scientists provide scientific support when the U.S. Coast Guard responds to oil spills and chemical accidents, and they have developed many computer tools that they themselves use during hazmat responses. The tools created by OR&R are shared with other responders at no cost. CAMEO is by far their most popular product. Over the past two decades, CAMEO has become the most widely used chemical emergency response and planning tool in the U.S. These days, chances are that your city's fire department uses CAMEO. Since 9/11, CAMEO has experienced a ten-fold increase in use. There have been more than 200,000 downloads of CAMEO in the past three years. Each year, thousands of first responders and emergency planners are trained to use CAMEO in classes led by more than 100 CAMEO-certified instructors.

The earliest versions of CAMEO were designed to support emergency responders, and then it became clear that it can also be used as an emergency preparedness tool. Additional features were incorporated specifically for planners, whose work includes the difficult task of assessing the hazards to communities from chemicals stored at industrial facilities. NOAA and EPA collaborated to develop a database in which users can store information about industrial facilities in their communities, and the chemical inventories maintained at those facilities. Over the years, CAMEO has gained international stature. The United Nations Environment Programme has adopted CAMEO and has provided training in 50 countries. CAMEO has been translated into French and Spanish.

EPA and NOAA developed the web site http://www.epa.gov/ceppo/cameo to facilitate the use of CAMEO and to offer online technical support to users.

## *CAMEO 20th Year Anniversary Conference*

# Join the CAMEO 20th Year Anniversary Conference from October 30, 2006 to November 1, 2006 in Houston, Texas.

This conference is sponsored by the Environmental Protection Agency, National Oceanic & Atmospheric Administration, and The Greater Houston Local Emergency Planning Committee.

## Course Descriptions

- **Using the CAMEO Companion**

Practice using CAMEO Companion techniques to work with CAMEO, ALOHA, MARPLOT, and LandView.

- **ALOHA Overview**

Review of basic concepts of toxic gas modeling. Suitable for new ALOHA users.

- **CAMEO Refresher**

Review of basic CAMEO concepts and operations. Suitable for new CAMEO users and those desiring a refresher course.

- **Using ALOHA for Fires and Explosions Scenarios**

Covers concepts of toxic gas, fires, and explosions modeling, with hands-on practice emphasizing ALOHA's new fires and explosions modeling capabilities. Suitable for experienced ALOHA users.

- **Undercover CAMEO: Advanced Topics**

Survey of advanced CAMEO topics including. Suitable for experienced CAMEO users.

- **CAMEO and Chemical Reactions**

Discussion of chemical reactivity concepts and hands-on practice using CAMEO's chemical records and Reactivity Worksheet to understand potential reactivity hazards of chemicals. Suitable for new and experienced CAMEO users.

Visit conference website:
http://www.hotzone.org/2006%20cameo%20conference/2006_cameo.htm
Conference Registration Fee - $125.00
Contact: **angie.mills@westonsolutions.com**
or call **469-374-7717**

**Off-site Consequence Analysis**

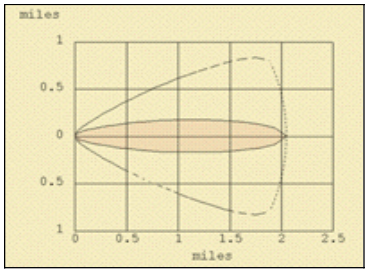
# MODELING CHEMICAL SPILLS

Many chemicals behave in somewhat predictable ways when spilled. The way a spill of gases or liquids will disperse can be "modeled." The chemical spill will tend to dissipate upwards, and to the sides and endpoint of the plume. The rate of upward dissipation depends on whether the chemical is a buoyant gas that rises, or if it is a heavy gas that tends to sink. A spill of a heavy gas will tend to travel further along the surface of the ground while a buoyant gas will tend to rise up and away from the spill site.

**CAMEO** is a comprehensive computer software program that aids in modeling chemical spills. **ALOHA** (Areal Location of Hazardous Atmospheres) is a component of this software. ALOHA is an air-dispersion model used to evaluate hazardous chemical scenarios and determine the likely "footprint" (plume model) of such spills. (To download the software, go to http://www.epa.gov/ceppo/cameo)**.**

## ALOHA's Calculation - The "Footprint"

After the requisite data has been entered into ALOHA, then ALOHA will give the likely "footprint" of a spill (an example is shown below).

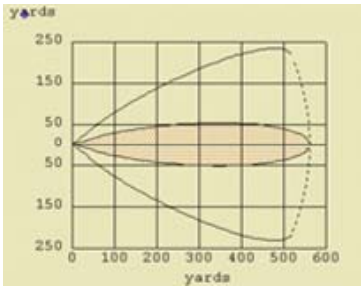



ALOHA's footprint will show the distance of the plume, and a shaded area where it predicts the chemical will be at levels above the IDLH (immediately dangerous to life or health), or other levels entered into the computer. It will also show an area on either side of the plume that represents other areas that the plume could travel to. The center, shaded area is what ALOHA statistically predicts 19 out of 20 times the plume will be. The other areas on either side of the plume represent a 1 out of 20 chance of the plume going there.

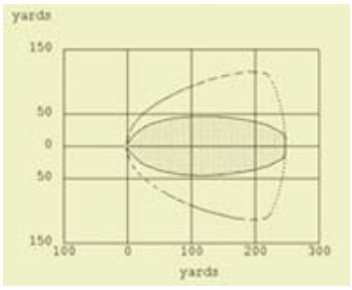
# Illustrations of ALOHA "Footprints"

## *Light and Heavy Gases*

In the illustration below, ammonia and benzene were chosen to show the differences between the "footprints" of spills of liquids that produce light and heavy gases. Ammonia produces a light gas, and benzene produces a heavy gas.



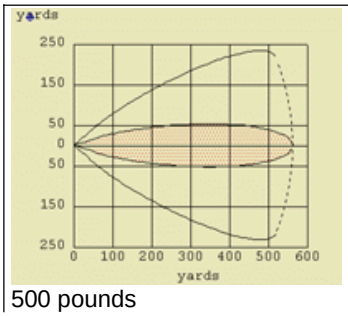
Ammonia



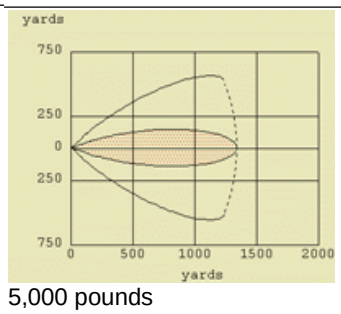
Benzene

## *Volume of Spills*

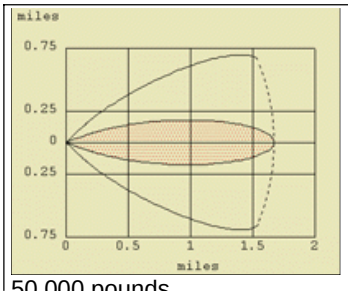
The illustrations below are meant to show an approximation of a complete spill of ammonia from a barrel (500 lbs), a small tank (5,000 lbs), a tanker truck load (50,000 lbs), and a tank farm sized tank (500,000 lbs). These sizes of spills and tanks are those that can be commonly found in the facilities. The "footprint" of a chemical spill does not correlate proportionately with the increase in the amount spilled. For example, the "footprint" of a spill of a 5,000 lbs tank chemical is not ten times the size of the "footprint" of a 500 pounds spill. This is an important concept.



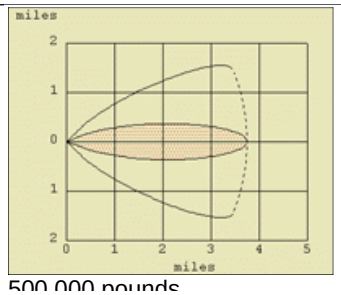
500 pounds



5,000 pounds



50,000 pounds

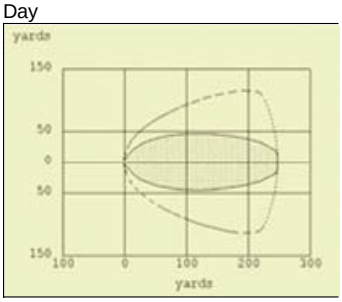


500,000 pounds

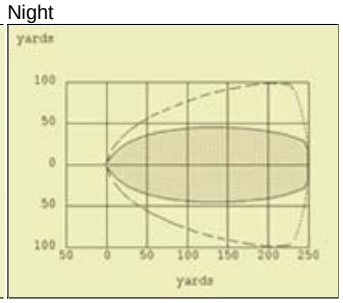
## *Effect of Temperature*

These chemical spills are "modeled" at cool to hot temperatures, to illustrate the effect temperature has on dispersion of gases. The difference in daytime and nighttime models shows what effect the sun and warmth has.

Day



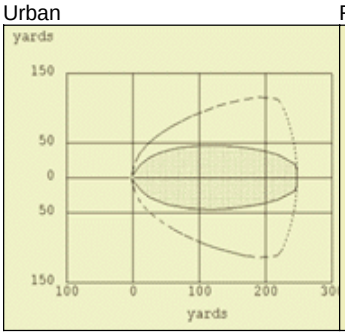

Night



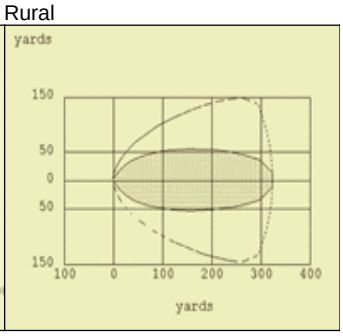

## *Urban and Rural Setting*

The difference in urban and rural (open country) are also illustrated. Rural setting has no trees or tall buildings while an urban setting has many obstacles to impede the spread of the plume of chemical vapors.

Urban



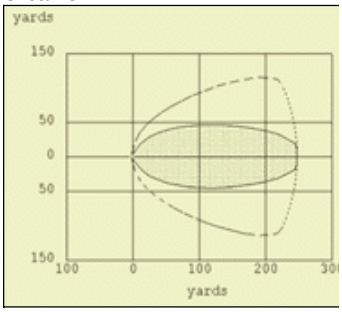

Rural



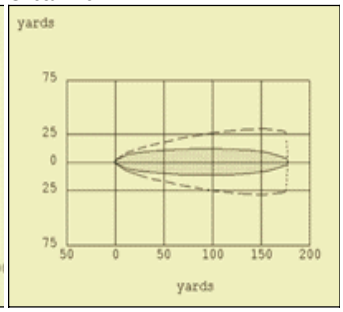

## *Wind Speed Variations*

The models were conducted at 5 knots and 20 knots, to illustrate the difference between a small breeze and a brisk breeze on the dispersion of the gases.

Urban 5 k




Urban 20 k



## *Nominate your LEPC !*

***For***

**Deadline: January 31, 2007**

### What are the Community Awards?

Each year the Chemical Educational Foundation (CEF) acknowledges the active and important work of several excelling Local Emergency Planning Committees (LEPC's). These are community-based organizations created to prevent, prepare for, and respond to accidental or deliberate incidents involving hazardous chemicals.

The 2006 Community Award Submission Form is now available for download at www.chemed.org.

### Entry Requirements

- Open to all LEPCs.
- LEPCs can nominate themselves or be nominated by individuals in the chemical industry.
- Due to the wide variety of populations served by LEPCs, the Community Award has been divided into three population-based categories: (a) 50,000 and under (b) 50,001 to 250,000 and (c) 250,001and above
- Each submission must include the submission form detailing organizational and programmatic information.
- Each submission must include a 250 word statement from the LEPC describing how they believe they have impacted their community through partnerships and outreach programs over the past year.
- Judging is based on the 2004-2005 calendar years. If your LEPC has ongoing programs/publications which originated in previous years please provide specific examples and feedback from the community as to how it impacted the community in the 2004-2005 years. Other years' activities will be taken into account, but will carry less weight with the judges.
- Each LEPC is encouraged to send supplementary material, including power point presentations, videos, brochures, newspaper clippings etc. However, if you are sending hard copies of brochures or publications be sure to send enough for at least six judges. CEF is unable to return materials provided.
- An independent panel of judges that represents industry, government, media, and former winners will select the winners.
- The LEPC from each category that best displays a commitment to public safety, industry and community partnerships and chemical safety awareness will be awarded.

**Emergency Planning**

# WHAT ARE LEPCS ?

The Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA) calls for the establishment of **Local Emergency Planning Committees** (**LEPC**s). The primary work of LEPCs is to receive information from local facilities about chemicals in the community, use that information to develop a comprehensive emergency plan for the community, and respond to public inquiries about local chemical hazards and releases. Most LEPCs are organized to serve a county; some are for a single large city; others cover the better part of an entire state.

When an LEPC is organized, representatives in all of the following areas are encouraged to participate:

- Broadcast and print media
- Chemical companies
- Civil defense
- Community groups
- Elected and local government officials
- Firefighting
- First aid
- Health
- Hospitals
- Law enforcement
- Local environmental & transportation agencies
- Representatives of facilities subject to the emergency planning and community right-to-know requirements Transportation companies

LEPC members represent their communities and serve as resources for citizens to learn about hazardous substances and emergency planning.

Many LEPCs have found face-to-face interactions with the public, like community fairs, a very effective method of communicating. Other ways that LEPCs educate the public include distributing brochures and videos on topics such as chemical awareness, and what to do in a chemical emergency. LEPCs also annually review, test, and update emergency plans for their planning district. An emergency plan should include:

- The identity and location of hazardous materials
- Procedures for immediate response to a chemical accident
- Ways to notify the public about actions they should take
- Names of coordinators at chemical plants
- Schedules and arrangements for testing the plan. Emergency drills are conducted to test these plans. LEPCs communicate these activities to the public, often through public meetings, newspaper articles and web sites.

**EPCRA Corner**

# UNDERSTANDING TRI DATA

The Toxic Release Inventory (TRI) is a database of information about releases and transfers of toxic chemicals from facilities in certain industrial sectors, including manufacturing, waste handling, mining, and electricity generation. Facilities must also report the total amount of toxic chemicals in waste that they produce. Facilities must report to TRI if they fulfill four criteria:

1. They must be a manufacturing facility in a specified Standard Industrial Classification (SIC) Code;
2. They must have the equivalent of 10 full-time workers;
3. They must either manufacture or process more than 25,000 lbs of the chemical or use more than 10,000 lbs during the year (unless the chemical is a "PBT");
4. The chemical must be on the TRI list of specific toxic chemicals or chemical categories.

Currently, EPA's list of SIC codes includes the following industrial categories:

- Major group code 10 (metal mining), except 1011, 1081, and 1094
- Major group code 12 (coal mining), except 1241
- Major group codes 20-39 (manufacturing)
- Industry codes 4911, 4931, and 4939 (electrical utilities that combust coal and/or oil)
- Industry code 4953 (RCRA Subtitle C hazardous waste treatment and disposal facilities)
- Industry code 5169 (chemicals and allied products wholesale distributors)
- Industry code 5171 (petroleum bulk plants and terminals)
- Industry code 7389 (solvent recovery services)

Therefore, not all pollution is reported in TRI. However, TRI does have these advantages:

- It is multi-media. Facilities must report the amounts they release to air, land, water, and underground separately, and must report how much they send off-site;
- All quantities are reported as amounts of toxic chemical (in pounds for all chemicals except Dioxin, which is in grams). This is an advantage compared to other databases which often report releases as concentrations or by volume of waste. These measures are often impossible to convert into pounds;
- It is congressionally mandated to be publicly available, by electronic and other means, to everyone. This means that it's relatively easy to obtain TRI data and that the data is well-known, becoming a national "yardstick" for measuring progress in pollution and waste generation.

The TRI data are reported by individual facilities, who send their reports to the federal Environmental Protection Agency (EPA) every year. These reports are filled out on a form called "Form R". EPA takes these forms and converts them into an electronic database. To better understand TRI data, visit the EPA TRI Web site at: http://www.epa.gov/tri/.

## TOXICS RELEASE INVENTORY SNAPSHOT OF EPA REGION 10

The 2004 Toxics Release Inventory (TRI) data were recently released by EPA, and two of the four Pacific Northwest states posted pollution reductions from 2003. Releases in Idaho and Washington were up from 2003, while Alaska and Oregon dropped slightly in toxic releases.

State data breakdown of total on- and off-site releases:

**ALASKA.** Facilities reported 512,278,274 pounds of chemicals released, down from the 539,644,265 pounds released in 2003.

**IDAHO.** Total releases in 2004 were 64,095,437 pounds, up slightly from the 61,524,493 pounds reported for 2003.

**OREGON.** Facilities reported 39,747,757 pounds released, down from the 40,681,402 pounds released in 2003.

**WASHINGTON.** Releases in 2004 totaled 32,798,429 pounds, up from the 22,552,908 pounds released in 2003.

**Safety Alert**

# DO YOU HAVE STORAGE PALLETS THAT LOOK LIKE THIS ?

Small charges for several batch processes were transferred into small containers and placed on a pallet near the reactors so they would be easily available when needed. The picture on the right shows a re-creation of the raw material pallet.

There was a fire in the manufacturing building which started on or near the pallet. The fire was extinguished by the building sprinkler system and there were no injuries. However, the fire caused extensive damage to electrical power, control and instrumentation wiring, and the plant was shut down for a long time while the damage was repaired.

The picture on the left below shows the actual pallet after the fire, and the picture on the right shows some of the damaged cable and wiring. The investigation revealed that the some of the materials in the containers were incompatible and, over time, chemicals had leaked from damaged containers, overfilled containers, or from spills on the outside of containers. Some of this material fell through the open grate floor into a cable tray below the floor. It was difficult to see the spilled material in the cable tray, or to clean it up, and eventually some of the spilled materials reacted, got hot, and burst into flame.


## What can you do ?

- Know about the compatibility of chemicals in your plant, and follow your plant's procedures for keeping incompatible materials apart in storage and use. Many plants use a chemical compatibility chart to summarize this information.
- Inspect all chemical containers regularly and ensure that they are properly labeled. Replace any containers which are damaged or leaking.
- Clean up all spills of materials immediately. Don't let spilled material accumulate, waiting to contact other materials in the future.
- Fill and empty chemical containers in approved locations where this can be done safely.
- Do not store chemical containers near fire exits, safety showers or eye wash stations, near electrical boxes and cable trays, or other important equipment.

(Source: CCPS Process Safety Beacon)

**RMP Regulated Facilities**

# INCIDENT SUMMARIES AND LESSONS LEARNED

## ▪ Gas Condensate Fire

Incident Description: On February 2, 2001, a fire occurred at Bethlehem Steel Corporation's Burns Harbor mill in Chesterton, Indiana. Two employees were killed, four were injured. Workers were attempting to remove a slip blind and a cracked valve from a coke oven gas line leading to a decommissioned furnace. During removal of the valve, flammable liquid was released and ignited… The investigation found that management systems for the supervision, planning, and execution of maintenance work, as well as systems for monitoring and controlling hazards were inadequate. In addition, the facility did not have a program to identify and address hazards that might be created by decommissioning and demolition operations.

*Steelmaking process at Burns Harbor mill, where gas condensate fire caused two deaths.*

## ▪ Reactive Chemical Explosion

Incident Description: On January 2, 2003, a vacuum dryer holding nearly 200 pounds of benzoyl peroxide exploded at the Catalyst Systems Inc. production facility in Gnadenhutten, Ohio. Employees were in the process of drying granular benzoyl peroxide, which is unstable at high concentrations, when the explosion occurred. The explosion and subsequent fire damaged the production facility, and one employee was injured while evacuating the building… Root causes of the incident included: absence of process safety management program; inadequate process safety information during process design; incomplete process flow diagrams, engineering drawings, and detailed operating procedures; incomplete formal hazard reviews during design and installation of the system; and absence of established preventive maintenance program.

*Catalyst Systems production facility shows damage after an explosion of benzoyl peroxide.*

## ▪ Hydrogen Sulfide Poisoning

Incident Description: On January 16, 2002, highly toxic hydrogen sulfide gas leaked from a sewer manway at the Georgia-Pacific Naheola mill in Pennington, Alabama. Several people working near the manway were exposed to the gas. Two contractors were killed. Eight employees were injured. Choctaw County paramedics who transported the victims to hospitals reported symptoms of hydrogen sulfide exposure… Investigators discovered a failure to follow good engineering and process safety practices; no management system to incorporate chemical hazard warnings into process safety information; failure to ensure that sewer remained closed; and inadequate training for contractors about the hazards of hydrogen sulfide.

(Source: Chemical Safety Board)

*Truck unloading area where two workers were killed by a hydrogen sulfide release.*